Amendments to the Claims Amendments to the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

1. (currently amended) A system for implementing a data storage quota comprising:

~~a computer system including a plurality of data storage devices and an authentication mechanism for authorizing a plurality of users based upon at least one of a plurality of unique identifiers;~~

~~a user group comprising a first set of users from the plurality of users, each user having a first identifier of the plurality of unique identifiers;~~

~~a hierarchic computer file system organized on top of one of the data storage devices, the hierarchic computer file system comprising a plurality of files, a plurality of parameters and a plurality of directories,~~

~~the plurality of files arranged into a plurality of trees,~~

~~each file having a second identifier from the plurality of unique identifiers,~~

~~the parameters describing a plurality of qualitative characteristics of a level of consumption of file system resources by the plurality of users and the user group;~~

~~a quota system coupled to the hierarchic computer file system,~~

~~the quota system determining a used quantitative parameter of file resource consumption that is associated with the plurality of files and can identify a total value of a set of quantitative parameters of file resource consumption for at least one of the users;~~

~~wherein the set of the quantitative parameters are marked by a set of third identifiers of the plurality of unique identifiers coupled to the used quantitative parameter of file resource~~

~~consumption and to other quota parameters of the used quantitative parameter~~ a plurality of users associated with a computer system, each user having a unique identifier;

a hierarchic file system on top of a data storage device, wherein the hierarchic file system comprises a plurality of files and a plurality of directories;

the plurality of files and directories stored on the storage device and arranged into a plurality of trees, wherein each file and each directory has at least one unique identifier;

a level of consumption associated with a plurality of resources of the hierarchic file system;

a second file system mounted inside any available directory of the hierarchic file system such that the computer system uses the second file system as a new tree of the hierarchic file system;

a quantitative parameter calculated to correspond to file resource consumption associated with the new tree, wherein the system calculates the quantitative parameter by:

defining a quota for a level of consumptions of a plurality of resources of the hierarchic file system related to the new tree;

analyzing a full access path to one of the files to determine whether the file belongs to the new tree and should be associated with the quota, based on the full access path that includes the new tree;

associating a file request for data allocation to the one of the files as being related to the new tree quota;

for the new tree, storing the current level of consumption and the quota for the level of consumptions of a plurality of resources of the hierarchic file system associated with the unique identifiers;

in response to requests for data allocation, providing responses to the requests,
including an allowed level of consumption associated with quota for the level of
consumption of a plurality of resources of the hierarchic file system, based on the current
level and the quota for the level of consumption of a plurality of resources of the
hierarchic file system; and

based on the responses, determining whether the requests can be fulfilled in full or
fulfilled in part.

2. (currently amended) The system of Claim 1, wherein said hierarchic ~~computer~~ file
system can have a hidden root directory that is not visible to said plurality of users.

3. (currently amended) The system of Claim 1, wherein ~~said second~~ at least one
identifier acts as an attribute to denote belonging to at least one of said plurality of users and ~~said~~
at least one user group.

4. (original) The system of Claim 1, wherein said hierarchic ~~computer~~ file system
further comprises a specific data storage space mounted to an available directory area, said
specific data storage area comprising a second computer file system.

5. (currently amended) The system of Claim 4, wherein ~~said second computer file~~
~~system is mounted inside said available directory of said hierarchic computer file system,~~
~~wherein after said second computer file system is mounted,~~ said computer system has an
opportunity to use said second computer file system as an extension of said hierarchic ~~computer~~
file system.

6. (canceled)

7. (currently amended) The system of Claim 1, wherein said plurality of directories and
said available directory act as a plurality of mounting points of said hierarchic ~~computer~~ file

system, wherein said plurality of mounting points are located inside said hierarchic ~~computer~~ file system, and wherein said plurality of mounting points are utilized by a plurality of mounting objects.

8. (previously presented) The system of Claim 7, wherein said plurality of mounting objects comprise a plurality of file system volumes and a plurality of file system sub-trees.

9. (currently amended) The system of Claim 1, wherein said plurality of unique identifiers ~~can be~~ are within a context of an operating system.

10. (original) The system of Claim 9, further comprising a computer network connected with said computer system and wherein said context of said operating system comprises a set of identifiers unique in said computer network.

11. (original) The system of Claim 9, wherein said context of said operating system comprises a set of identifiers unique on said computer system.

12. (original) The system of Claim 9, wherein said context of said operating system comprises a set of identifiers unique to an allocated area of said computer system.

13. (original) The system of Claim 12, wherein said allocated area comprises a chroot environment.

14. (original) The system of Claim 12, wherein said allocated area comprises a virtual environment.

15. (currently amended) The system of Claim 1, wherein said plurality of parameters of said hierarchic ~~computer~~ file system comprises at least one of a consumption parameter on a size of at least one of said plurality of data storage devices associated with at least one of said plurality of users and said user group, a consumption parameter on a number of various auxiliary file system structures used to arrange files of at least one of said plurality of users and said user

group, a consumption parameter on other parameters of auxiliary operations performed by an

operating system to serve at least one of said plurality of users and said user group during a

period of time, and a consumption parameter on a time and range of modifications of any of said

above consumption parameters that allow a user to modify already defined limitations.

16. (currently amended) The system of Claim 1, wherein ~~said~~ use of the quota ~~system~~

~~can operate with said hierarchic computer file system and~~ does not require modification of a

manner in which data and file metadata are represented in said hierarchic ~~computer~~ file system,

as well as a way of representing file system service data in said at least one of said plurality of

data storage devices organized below said hierarchic ~~computer~~ file system.

17. (currently amended) A method for implementing a data storage quota comprising:

authorizing a plurality of users within a computer system with a plurality of unique

identifiers of any context of an operating system;

grouping a first set of users of the plurality of users in a user group, each user in the first

group having at least one unique identifier;

organizing a hierarchic computer file system on top of a data storage device, wherein the

hierarchic computer file system comprises a plurality of files, a plurality of parameters and a

plurality of directories;

arranging the plurality of files into a plurality of trees, wherein each file has at least one

unique identifier to denote belonging to at least one user of the first group and to the user group;

describing qualitative characteristics of a level of consumption of a plurality of resources

of the hierarchic computer file system by at least one user and the user group via the plurality of

parameters;

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mounting a specific data storage area as a second file system inside any available directory of the hierarchic computer file system,

wherein, after the mounting, the computer system can use the second file system as an extension of a new tree of the hierarchic computer file system;

calculating a used quantitative parameter of file resource consumption associated with the plurality of files; and

informing at least one user of a total value of a set of quantitative parameters of file resource consumption using the used quantitative parameter,

wherein said calculating step further comprises:

defining a calculation area of an occupied space as a sub-tree of said hierarchic computer file system located on a search path below any of said plurality of directories;

using an algorithm to analyze a full access path to at least one of said plurality of files and to define belonging of said at least one file to said calculation area,

wherein said belonging to said area is defined by a presence of an address of any one of said plurality of directories that starts from a directory root in said full access path;

associating at least one of said plurality of files with at least one of said plurality of unique identifiers for identifying at least one of said plurality of users and said user group via a usage of information stored in said hierarchic computer file system as information about file ownership;

using one of a special file, a data storage area, a computer operating memory and a special server that stores and updates data comprising one of a current size of an occupied space and a quantitative parameter of file resource consumption that is associated with at least one of said unique identifiers;

serving a plurality of operating services via one of a special program of said operating

system and a kernel of said operating system, said plurality of operating services comprising a

plurality of requests for data allocation in at least one of said storage devices and a plurality of

answers of said plurality of requests about sizes of allowed and currently occupied area of said

data storage devices by a user associated with at least one of said plurality of unique identifiers;

using one of said special file, said data storage area, said computer operating memory and

said special network server by at least one of said special program and said operating system

kernel; and

defining an opportunity to reserve space for user data identified by at least of one of said

plurality of identifiers via a usage of one of said special file, said data storage area, said

computer operating memory and said special network server by at least one of said operating

system services.

18. (original) The method of Claim 17, wherein said calculating step further comprises:

coupling a set of identifiers from said plurality of unique identifiers to said used

quantitative parameter of file resource consumption; and

marking said set of quantitative parameters of file resource consumption with said set of

identifiers from said plurality of unique identifiers and other quota parameters of said used

quantitative parameter of file resource consumption.

19. (previously presented) The method of Claim 17, wherein a set of directories within

said plurality of directories comprises a plurality of mounting points of said hierarchic computer

file system, wherein said plurality of mounting points are located inside said hierarchic computer

file system, and wherein a file system volume and a file system sub-tree can each be used as a

mounting object for said plurality of mounting points.

20. (canceled)

21. (currently amended) The method of Claim [[20]] 17, wherein said calculating step further comprises:

initializing at least one of said special file, said data storage area, said computer operating memory and said special server for storage and update of information about current size of said used quantitative parameter of file resource consumption that defines initial values for a plurality of usage parameters of a data storage space for at least one of said plurality of unique identifiers associated with an area of said used quantitative parameter of file resource consumption;

setting up values of usage limits of data storage space for at least one of said plurality of users and said user group; and

tracking of alteration quantitative characteristics of a resource consumption level.

22. (original) The method of Claim 21, wherein said serving said plurality of operating services uses a plurality of defined parameters from said plurality of parameters of said hierarchic computer file system and wherein said plurality of defined parameters are used to manage an allocation of a data storage area within said hierarchic computer file system.

23. (currently amended) The method of Claim [[20]] 17, wherein said calculating step further comprises:

releasing an allocated area size and a plurality of other data storage parameters; and

modifying said allocated area size and said plurality of other data storage parameters;

wherein said releasing and modifying steps are performed by at least one of said special program of said operating system and said operating system kernel.

24. (original) The method of Claim 17, wherein said calculating step further comprises:

releasing an allocated area size and a plurality of other data storage parameters; and

modifying said allocated area size and said plurality of other data storage parameters.

25. (previously presented) The method of Claim 24, wherein said releasing and modifying step comprises:

for an operation to be performed on a file, identifying the file and which quotas are associated with that file and that operation, wherein the quotas include resource consumption parameters;

determining unique identifiers associated with the quotas;

determining current resource consumption parameters for the file;

for each current resource consumption parameter, identifying a plurality of limitations associated with the current resource consumption parameters based on the quotas associated with at least one user;

comparing the identified limitations with a current value of available resources, wherein the resources include any of a storage usage, a current state of the computer system, a current state of the hierarchic computer file system and a requested size for an allocated space and other parameters of data storage;

determining whether the operation can be performed, based on the comparing step;

executing the operation; and

based on the determining step, updating the current resource consumption parameter, wherein the current resource consumption parameter is stored in any of a special file, a data storage area, a computer operating memory, and a server.

26. (original) The method of Claim 25, wherein said releasing and modifying steps are performed by at least one of a special program of said operating system and a kernel of said operating system.

27. (original) The method of Claim 17, wherein said plurality of parameters of said hierarchic computer file system comprises at least one of a consumption parameter on a size of at least one of said plurality of data storage devices associated with at least one of said plurality of users and said user group, a consumption parameter on a number of various auxiliary file system structures used to arrange files of at least one of said plurality of users and said user group, a consumption parameter on other parameters of auxiliary operations performed by an operating system to serve at least one of said plurality of users and said user group during a period of time, and a consumption parameter on a time and range of modifications of any of said above consumption parameters that allows for use by a user to modify already defined limitations.

28. (original) The method of Claim 17, said calculating step can operate on top of said hierarchic computer file system and does not require modification of any manner in which data and file metadata are represented, as well as any way file system service data is represented in said storage device of said hierarchic computer file system.

29. (currently amended) The method of Claim 17, wherein the calculating step further comprises:

defining a sub-tree of the hierarchic computer file system that includes at least one directory and at least one file; and

identifying the file as belonging to the sub-tree by analyzing a full access path to the file, based on a presence of an address of any one of the directories that includes the file and where the full access path includes a directory root[[;]].

30. (previously presented) The method of Claim 29, wherein the calculating step further comprises associating the file with one of the unique identifiers for identifying one of the users

and the user group through file ownership information stored in the hierarchic computer file system;

31. (previously presented) The method of Claim 30, wherein the calculating step further comprises using, for the calculating step, a current value of a quantitative parameter of file resource consumption that is associated with the one of the unique identifiers.

32. (previously presented) The method of Claim 31, wherein the calculating step further comprises deciding whether the operating system can respond to requests that relate to the file,

wherein the deciding step is based on the current value and a value of the quantitative parameter required to respond to the requests.

33. (currently amended) The method of Claim 32, wherein the requests affect the quantitative parameter, and

wherein the response to the requests ~~may include~~ <u>includes</u> modifying parameters of the request and parameters of a service process used by the operating system to service the request.

34. (previously presented) The method of Claim 31, further comprising releasing storage space, based on the quantitative parameter, for user data identified by the one unique identifier.

35. (previously presented) The method of Claim 31, further comprising reserving storage space, based on the quantitative parameter, for user data identified by the one unique identifier.

36. (previously presented) The method of Claim 31, further comprising modifying an amount of allocated storage space, based on the quantitative parameter, for user data identified by the one unique identifier.

37. (previously presented) The method of Claim 31, wherein the calculating step further comprises:

initializing the current value of the quantitative parameter to a calculated initial value of the quantitative parameter associated with the unique identifier.

38. (previously presented) The method of Claim 37, wherein the calculating step further comprises:

setting up values of usage limits for the quantitative parameter for the one unique identifier.

39. (previously presented) The method of Claim 38, wherein the calculating step further comprises tracking changes of a resource consumption level due to processing of the requests by the operating system.

40. (previously presented) The method of Claim 32, wherein the deciding step is performed for all requests to the operating system for file access.

41. (previously presented) The method of Claim 29, wherein the calculating step further comprises:

releasing an allocated area size and a plurality of other data storage parameters, wherein the allocated area size is part of the quantitative parameter; and

modifying the allocated area size and the plurality of other data storage parameters;

wherein the releasing and modifying steps are performed by the operating system.

42. (previously presented) The method of Claim 17, wherein the quantitative parameter is stored in any of a special file and a special server.

43. (new) A method for implementing a data storage quota comprising:

creating a plurality of users within a computer system, each user having a unique

identifier;

organizing a hierarchic file system on top of a data storage device, wherein the hierarchic

file system comprises a plurality of files and a plurality of directories;

arranging the plurality of files and directories into a plurality of trees, wherein each file

and each directory has at least one unique identifier;

describing a level of consumption of a plurality of resources of the hierarchic file system;

mounting a second file system inside any available directory of the hierarchic file system

such that the computer system uses the second file system as a new tree of the hierarchic file

system;

calculating a quantitative parameter corresponding to file resource consumption

associated with the new tree, wherein the calculating further comprises:

defining a quota for a level of consumptions of a plurality of resources of the

hierarchic file system related to the new tree;

analyzing a full access path to one of the files to determine whether the file

belongs to the new tree and should be associated with the quota, based on the full access

path that includes the new tree;

associating a file request for data allocation to the one of the files as being related

to the new tree quota;

for the new tree, storing the current level of consumption and the quota for the

level of consumptions of a plurality of resources of the hierarchic file system associated

with the unique identifiers;

in response to requests for data allocation, providing responses to the requests, including an allowed level of consumption associated with quota for the level of consumption of a plurality of resources of the hierarchic file system, based on the current level and the quota for the level of consumption of a plurality of resources of the hierarchic file system; and

based on the responses, determining whether the requests can be fulfilled in full or fulfilled in part.